

AMENDMENTS TO THE CLAIMS

Claims 1-12 (Cancelled)

Claim 13. (previously presented): A method for distance measurement using a radio system, comprising:

measuring a coarse distance between a first radio transceiver and a second radio transceiver, the coarse distance representing a first distance measurement between the first radio transceiver and the second radio transceiver in coarse resolution;

measuring a fine distance between the first radio transceiver and the second radio transceiver, the fine distance representing a second distance measurement between the first radio transceiver and the second radio transceiver in fine resolution,

determining the distance between the first radio transceiver and the second radio transceiver using the first distance measurement in conjunction with the second distance measurement.

Claim 14. (previously presented): The method for distance measurement of claim 13 further comprising:

generating a transmit timing signal;

generating a receive timing signal; and

generating a time delay signal based on the transmit timing signal and the receive timing signal; and

wherein the first distance measurement is determined using the time delay signal.

Claim 15. (previously presented): The method for distance measurement of claim 14, further comprising:

generating a first timing signal, TX(I), using the transmit timing signal;

generating a second timing signal, RX, using the receive timing signal; and

generating a third timing signal, TX(Q), using at least one of the transmit timing signal and TX(I).

Claim 16. (previously presented): The method for distance measurement of claim 15 ~~3~~, further comprising:

generating an in-phase (I) signal using the TX(I) and RX signals; and

generating a quadrature (Q) signal using the TX(Q) and RX signals,

wherein the second distance measurement is determined using the in-phase (I) signal and the quadrature (Q) signal.

Claim 17. (previously presented): The method for distance measurement of claim ~~{4}~~ 16, further comprising:

converting the in-phase (I) signal into a I_{dc} signal having an average dc value of the in-phase (I) signal; and

converting the quadrature (Q) signal into a Q_{dc} signal having an average dc value of the quadrature (Q) signal,

wherein the second distance measurement is determined using the I_{dc} signal and the Q_{dc} signal.

Claim 18. (previously presented): The method for distance measurement of claim 17 ~~5~~, wherein converting the in-phase (I) signal into a I_{dc} signal comprises:

low pass filtering the in-phase (I) signal to remove the ac component.

Claim 19. (previously presented): The method for distance measurement of claim 17 ~~5~~, wherein converting the quadrature (Q) signal into a Q_{dc} signal comprises:

low pass filtering the quadrature (Q) signal to remove the ac component.

Claim 20. (previously presented): The method for distance measurement of claim 17
5, further comprising:

converting the I_{dc} signal into a first digital output (I_1) signal; and

converting the Q_{dc} signal into a second digital output (Q_1) signal,

wherein the second distance measurement is determined using the I_1 signal and
the Q_1 signal.

Claim 21. (previously presented): The method for distance measurement of claim 20
8, further comprising:

evaluating an I_z variable from the I_1 signal; and

evaluating a Q_z variable from the Q_1 signal,

wherein the second distance measurement is determined using the I_z variable and
the Q_z variable.

Claim 22. (previously presented): A system for measuring distance using a radio
system, comprising:

a coarse distance measurement circuit to measure a coarse distance between a first
radio transceiver and a second radio transceiver, the coarse distance representing a first
distance measurement between the first radio transceiver and the second radio transceiver
in coarse resolution; and

a fine distance measurement circuit to measure a fine distance between the first
radio transceiver and the second radio transceiver, the fine distance representing a second
distance measurement between the first radio transceiver and the second radio transceiver
in fine resolution,

wherein the distance between the first radio transceiver and the second radio transceiver is determined using the first distance measurement in conjunction with the second distance measurement.

Claim 23. (previously presented): The system for measuring distance of claim ~~10~~ 22, further comprising:

a transmit time base generator to generate a transmit timing signal;

a receive time base generator to generate a receive timing signal; and

a time delay signal generator to generate a time delay signal based on the transmit timing signal and the receive timing signal,

wherein the first distance measurement is determined using the time delay signal.

Claim 24. (previously presented): The system for measuring distance of claim ~~11~~ 23, further comprising:

a means for generating a first timing signal, TX(I), using the transmit timing signal;

a means for generating a second timing signal, RX, using the receive timing signal; and

a means for generating a third timing signal, TX(Q), using at least one of the transmit timing signal and TX(I).

Claim 25. (previously presented): The system for measuring distance of claim ~~12~~ 24, further comprising:

an in-phase (I) signal generator to generate an in-phase (I) signal using the TX(I) and RX signals; and

a quadrature (Q) signal generator to generate a quadrature (Q) signal using the TX(Q) and RX signals,

wherein the second distance measurement is determined using the in-phase (I) signal and the quadrature (Q) signal.

Claim 26. (previously presented): The system for measuring distance of claim ~~13~~ 25, further comprising:

a first converter to convert the in-phase (I) signal into a I_{dc} signal having an average dc value of the in-phase (I) signal; and

a second converter to convert the quadrature (Q) signal into a Q_{dc} signal having an average dc value of the quadrature (Q) signal,

wherein the second distance measurement is determined using the I_{dc} signal and the Q_{dc} signal.

Claim 27. (previously presented): The system for measuring distance of claim ~~14~~ 26, wherein the first converter comprises:

a low pass filter to remove the ac component from the in-phase (I) signal.

Claim 28. (previously presented): The system for measuring distance of claim ~~14~~ 26, wherein the second converter comprises:

a low pass filter to remove the ac component from the quadrature (Q) signal.

Claim 29. (previously presented): The system for measuring distance of claim ~~14~~ 26, further comprising:

a first A/D converter to convert the I_{dc} signal into a first digital output (I_1) signal;
and

a second A/D converter to convert the Q_{dc} signal into a second digital output (Q_1) signal,

wherein the second distance measurement is determined using the I_1 signal and the Q_1 signal.

Claim 30. (previously presented): The system for measuring distance of claim ~~17~~ 29, further comprising:

a processor for evaluating an I_z variable from the I_1 signal and a Q_z variable from the Q_1 signal,

wherein the second distance measurement is determined using the I_z and Q_z variables.

Claim 31. (previously presented): A radio transceiver, comprising:

a coarse distance measurement circuit to measure a coarse distance between the first radio transceiver and a second radio transceiver, the coarse distance representing a first distance measurement between the first radio transceiver and the second radio transceiver in coarse resolution; and

a fine distance measurement circuit to measure a fine distance between the first radio transceiver and the second radio transceiver, the fine distance representing a second distance measurement between the first radio transceiver and the second radio transceiver in fine resolution,

wherein the distance between the first radio transceiver and the second radio transceiver is determined using the first distance measurement in conjunction with the second distance measurement.

Claim 32. (previously presented): A method for measuring distance, comprising:

performing a coarse distance measurement of a distance between a first radio transceiver and a second radio transceiver, said coarse distance measurement having a first resolution;

performing a fine distance measurement of the distance between the first radio transceiver and the second radio transceiver, said fine distance measurement having a second resolution that is more precise than said first resolution; and

determining the distance between the first radio transceiver and the second radio transceiver using said coarse distance measurement and said fine distance measurement.

Claim 33. (previously presented): The method for measuring distance of claim ~~20~~ 32, wherein said second resolution corresponds to the first resolution divided by an integer greater than 1.

Claim 34. (previously presented): The method for measuring distance of claim ~~20~~ 32, wherein said fine distance measurement is performed before, after or parallel to performing said coarse distance measurement.

Claim 35. (previously presented): The method for measuring distance of claim ~~20~~ 32, wherein each of said first radio transceiver and said second radio transceiver comprises one of a cellular phone, a PCS phone, an impulse radio, and a non-impulse radio.

Claim 36. (previously presented): The method for measuring distance of claim ~~20~~ 32, wherein each of said first radio transceiver and said second radio transceiver uses an optical signal.

Claim 37. (previously presented): The method for measuring distance of claim ~~24~~ 36, wherein said optical signal is generated by at least one of a laser and a light emitting diode (LED).